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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/798,556

03/12/2004

Hiromasa Sato

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08/31/2006

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,556

Applicant(s)

SATO ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-7 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-7 and 12-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 27, 2006 has been entered.
2. This Office Action is also in response to applicant's amendment filed on June 8, 2006, which has been entered into file.
3. By this amendment, the applicant has amended claims 4, 12 and 14 and has canceled claim 16.
4. Claims 4-7 and 12-15 remain pending in this application.

Response to Amendment

5. The amendment filed **June 8, 2006** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

claims 4, 12 and 14 have been amended to include the phrase "width of the incoming-side diffraction grating is configured such that only a center portion of the external light having stronger intensity than the peripheral portion of the external beam is passed through the first incoming side diffraction grating". The specification fails to give the positive support for the **width** of the incoming-side diffraction is configured to allow the external beam passing the incoming-side diffraction grating in the manner cited in the claims. Pages 36 to 37, of the specification completely silent about configure the **width** of the diffraction grating.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 4-7 and 12-15 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added matters are set forth in the paragraphs above.

Claims 4-7 and 12-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 4, 12 and 14 have been amended to include the feature of “a *width* of the incoming-side diffraction grating is configured such that only a center portion of the external light having a stronger intensity than a peripheral portion of the external light passes through the incoming side diffraction grating”. The specification and the claims fail to teach how could by configuring the width of the incoming-side diffraction grating, only center portion of an external beam, having all different beam waist, can pass through the diffraction grating. The condition of allowing only center portion of the external beam to pass the diffraction grating really depends on the beam waist of the incident beam not just on the width of the diffraction grating.

Claim Objections

8. Claims 4-7 and 12-14 are objected to because of the following informalities:

(1). The phrase “stronger intensity” recited in the amended claims 4, 12 and 14 is confusing and indefinite since it is not clear what is considered to be “stronger” intensity? How could the intensity has strength? What does it mean by stronger intensity as opposed to “weaker intensity”?

(2). The phase “the first incoming side diffraction grating” recited in claims 4 and 12 is confusing and indefinite for it lacks proper antecedent basis from earlier part of the claims.

(3). The amended phrase “saw-tooth shape” recited in claim 7 is confusing since it is not clear if this is referred to the saw-tooth or the pseudo sawtooth diffraction grating as recited in its based claim 6. What is a saw-tooth shape that is comprised within a pseudo saw-tooth diffraction grating?

Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4-6, 12 and 14-15 rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nakanishi et al (PN. 6,728,034) in view of the patent issued to Morton et al (PN. 5,999,318).

Nakanishi et al teaches a *diffraction optical element* that is comprised of a transparent *substrate* (1, Figures 6, 7A, 7B, 10 and 22), wherein a first *diffraction grating pattern* (4), serves as the *incoming-*

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side diffraction grating, is formed on the *central* region of the incoming-side surface of the *transparent substrate* wherein an external light incidents (L0), and at least one *second diffraction gratings* (5 and 6, or 9 and 10), serves as the *first outgoing-side diffraction and second outgoing-side diffraction grating*, formed on the opposite (or *outgoing-side*) surface, (with respect to the first diffraction grating pattern), of the substrate. Nakanishi et al teaches that the *pitch* of the incoming side diffraction grating pattern is the *same* as the *pitch* of the outgoing-side diffraction grating pattern, (please see column 3, lines 38-40 and column 10, lines 40-52). Nakanishi et al further teaches that each of the first and second diffraction grating patterns comprises a plurality of *slits* and as demonstrated by the drawings 1-17 and 19A, the slit pattern comprises *concave/convex shape*, (please see columns 3-4, 6, 8, and 10). Nakanishi et al teaches that the first and second outgoing-side diffraction gratings (5 and 6) is configured to receive the light **diffracted** from the incoming-side diffraction grating (4), which *means the second outgoing-side diffraction grating positioned on a light path of a light diffracted by the incoming-side diffraction grating*. Nakanishi et al teaches that the outgoing side diffraction grating can be designed to be **reflective** grating, as demonstrated in Figures 6, 7A, and 7B).

With regard to the feature concerning a reflective layer covers the second outgoing-side diffraction grating as recited in claims 4, 12 and 14, Nakanishi et al teaches that the outgoing-side diffraction gratings (5 or 6) can be reflective diffraction grating but it does not teach explicit to include a reflective layer for covering the diffraction grating. But it is standard practice in the art to make a reflective grating by using a reflective layer covering a transmission diffraction grating, as explicitly taught by **Morton** et al, (please see Figures 4 and 9). It would then have been obvious to make the reflective diffraction grating by using a reflective layer to cover the transmission diffraction grating for the benefit of actually making the reflective diffraction grating.

Claims 4, 12 and 14 have been amended to include the feature of “a *width* of the incoming-side diffraction grating is configured such that only a center portion of the external light having a stronger

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intensity than a peripheral portion of the external light passes through the incoming side diffraction grating". This feature is rejected under 35 USC 112 first paragraph as new matters not supported by the specification. One skilled in the art, would understand that a diffraction grating having a *definite* width will allow different portion of an external beam to pass through the diffraction grating, **depending** on the *beam waist* of the incident external beam. By adjusting the width of the diffraction grating *does not guarantee* that the external beam has only center portion passes through the diffraction grating for the external beam could have different beam waist. The feature therefore really cannot be examined since such condition really depends on the beam waist of the incident external beam and it really a matters of intended use of the diffractive optical element. One skilled in the art can certainly make the beam waist of the external beam has the relative size as compared to the width of the diffraction grating such that only center portion passes through it for the benefit allowing good coupling of the external light through the diffraction grating and the substrate and for the benefit of adjusting the amount of the light intensity passes through the device as desired.

With regard to claim 5, **Nakanishi** et al teaches that the outgoing side diffraction gratings (5 and 6, Figures 6-7B) may also be *reflection* type diffraction gratings.

With regard to claim 6, **Nakanishi** et al teaches that the outgoing side diffraction gratings (9 and 10, Figure 10) have a saw-tooth like diffraction grating profile.

With regard to claim 12, **Nakanishi** et al teaches that the diffractive optical element can be used in an optical pickup device, which could be considered as a wavelength measurement apparatus.

With regard to claim 15, **Nakanishi** et al does not teach *explicitly* that the first outgoing-side diffraction grating is placed at the center of the substrate. However one skilled in the art would understand that the position of the outgoing-side diffraction grating *determines* the light path that the light received from the incoming-side diffraction grating would travel after being diffracted by the outgoing-side diffraction grating. Such modification therefore is considered to be obvious matters of design choice

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to one skilled in the art for the benefit of making the light diffracted by the outgoing-side diffraction grating follows a specific path that suits for the specific needs.

11. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Nakanishi et al and Morton et al as applied to claims 1 and 12 above, and further in view of the patent issued to Chen et al (PN. 5,914,811).

The diffractive optical element taught by **Nakanishi et al** in combination with the teachings of **Morton et al** as described for claims 1 and 12 above have met all the limitations of the claims. The **Nakanishi et al** reference teaches that the outgoing side diffraction gratings may have *saw-tooth like shape* (9 and 10 in Figure 10), however it does not teach explicitly that the diffraction gratings are of *pseudo* saw-tooth like shape that is approximated by multiple stepped stairs. It also does not teach explicitly that the incoming diffraction grating is of saw-tooth shape. However using multiple stepped stairs structure to *approximate* the desired diffraction grating profile is rather well known in the art for it provides good accuracy for approximating the desired profile. **Chen et al** in the same filed of endeavor teaches explicitly that a *blazed* grating (i.e. saw-tooth like grating) can be approximated by blazed grooves with M-step stairs, (please see Figures 1 and 2). **Chen et al** teaches that the step heights are selected to best approximate the diffraction profile. It would then have been obvious to one skilled in the art to apply the teachings of **Chen et al** to use M-step stairs structure to approximate the saw-tooth like gratings and to make the incoming-side grating with such structure for the benefit of providing more accurate grating profiles for the diffraction gratings.

Response to Arguments

12. Applicant's arguments filed on June 8, 2006 have been fully considered but they are not persuasive. The newly amended claims and the newly added claims have been fully considered and rejected for the reasons stated above.

13. Applicant's arguments are mainly drawn to the newly amended features of the claims that have been fully addressed in the paragraphs above. The issues concerning the portion of the external beam that passes through the incoming diffraction grating really depends on the selection of the external beam to have certain beam waist relative with respect to the width of the diffraction grating. A definite width of the diffraction grating will NOT be able to allow external beam having all kind of beam waist to always having central portion passes the diffraction grating. This issue really is a manner of intended use and the specification really does not give support for "configuring the width of the incoming-side grating" to achieve the claimed feature. This feature therefore cannot be relied upon to overcome the rejections.

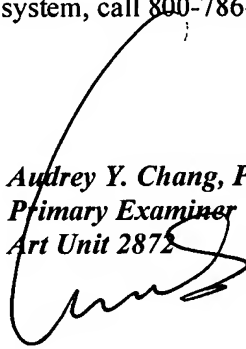
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.